



## Dr. Ronald Filadelfo

I am pleased to convene this panel on Adapting Maritime Infrastructure to Climate Challenges. As you will soon see, we have three perfect people to address these issues.

By way of background on the importance of these issues, in 2008, the National Intelligence Council, in one of its periodic National Intelligence Assessments, looked at the implications of climate change for national security. [1] The resulting National Intelligence Estimate (NIE) identified roughly 30 military installations

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that were thought to be at particular risk from rising sea levels. Obviously, Navy, Marine Corps, and Coast Guard facilities were very well represented on that list.

Based on the combination of that NIE, some work we did at CNA that looked at the links between climate change and national security, and some other work we did looking at the implications of the change in the Arctic for the Navy, Admiral Gary Roughead, the Chief of Naval Operations (CNO), asked the Naval Studies Board at the National Academy of Sciences to examine the national security implications of climate change for U.S. naval forces; I had the honor of serving on that panel. During our deliberations we spent quite a bit of time looking at infrastructure issues.

Going in, I thought the overall emphasis would be on operations and security. But to my surprise, infrastructure emerged as an area of significant concern to our Navy leadership. Our final report came out about a week ago, and the infrastructure section naturally led with a discussion of sea-level rise. [2] Sea-level rise, as you all know, is the real wild card of climate change because of its inherent unpredictability. That is, we cannot predict it really with any precision as to level or timing given the difficulties associated with modeling ice sheet dynamics.

Recently, there has been increasing concern within the science climate community about sea level given the growing consensus that the IPCC Fourth Assessment Report's prediction of sea-level rise this century is going to have to be modified upward, and perhaps significantly upward. [3] The National Academy of Sciences report recommended to the CNO and the Navy leadership that the Navy use a planning factor for sea-level rise of about 0.8 meters this century. [2] However, the report states that the rise could be as high as 2 meters. When the Naval Studies Board began its deliberations about 18 months ago, 2 meters was pretty much out of the question.

Of course, sea-level rise is not the only risk that our installation plan is going to need to consider. Water supply and water rights could be bigger issues than they are now. Of course, heat stress could affect our ability to train at our installations. Extreme weather

could also impact our infrastructure. So, our military services are now beginning to consider these things and look at how to meet these coming climate challenges.

The Interagency Climate Change Adaptation Task Force, which is run out of the White House, is co-chaired by the Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanic and Atmospheric Administration. The Task Force is staffed with representatives from about 20 federal agencies, including the DoD. This group recently recommended that the federal government strengthen the nation's capacity to plan for coming climate changes. [4] Interestingly, the Task Force further recommended that federal agencies make adaptation a standard part of agency planning; the DoD is now beginning to do this.

This is going to be challenging for the department. As the Naval Studies Board observes: "The Navy has billions of dollars in assets exposed to the threats of climate change, and it must make strategic decisions in the face of considerable uncertainty about the pace, magnitude and regional manifestations of climate change." [2] As we know, that is a point that Rear Admiral David Titley has been hammering home to our Navy leadership for the past 2 years. The pace is just very difficult to predict.

So, from the point of view of the DoD, several questions are going to need to be addressed in order to support informed infrastructure planning:

- What critical infrastructure considerations associated with climate change are applicable to DoD installations?
- At which steps in the current infrastructure planning process should climate change considerations be inserted?
- What policy changes might we need at the DoD, Department of the Navy level to ensure that these considerations are properly accounted for in our installation planning process that exists?

The panel we have assembled is well qualified to take on these and other infrastructure issues. I have asked Brigadier General Gerald Galloway to lead off, and he will discuss briefly some of the

infrastructure issues he sees looming from the perspective of climate-change engineering. The Honorable Jackalyn Pfannenstiel will then discuss issues particular to the Department of the Navy and will comment on what the Department is doing with regard to infrastructure planning. Finally, The Honorable John Warner will wrap up things from the national level.

## REFERENCES

1. House Permanent Select Committee on Intelligence and House Select Committee on Energy Independence and Global Warming: Statement for the Record by Dr. Thomas Fingar, Deputy Director of National Intelligence for Analysis, *National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030*, 2008, [http://www.dni.gov/testimonies/20080625\\_testimony.pdf](http://www.dni.gov/testimonies/20080625_testimony.pdf).
2. Naval Studies Board, *National Security Implications of Climate Change on U.S. Naval Forces*, National Academies Press, 2011.
3. Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, IPCC, 2007.
4. Climate Change Adaptation Task Force, *Progress Report of the Interagency Climate Change Adaptation Task Force*, 2010.